IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

| | |
|---|---|
| In re Application of<br>Han *et al.* | Patent Pending |
| Serial No.: 10/598,662 | Examiner: Ms. Denise R. Anderson |
| Filed: September 7, 2006 | Group Art Unit: 1797 |
| For: Fine Filtering Apparatus Controllable Packing Density Using Flexible Fiber | Confirmation No.: 8632 |
| Attorney's Docket No: 5952-064 | |

Mail Stop Appeal Brief-Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

**CERTIFICATE OF MAILING OR TRANSMISSION [37 CFR 1.8(a)]**

I hereby certify that this correspondence is being:

☐ deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to: Mail Stop Appeal Brief Patents, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

☐ transmitted by facsimile on the date shown below to the United States Patent and Trademark Office at (703) 273-8300.

September 28, 2010 Kathleen McDermott
Date Kathleen McDermott

This correspondence is being:
☒ electronically submitted via EFS-Web

## APPEAL BRIEF

This Appeal Brief is filed within two months of the Panel Decision on the PreAppeal Request for Review. Thus, a one month extension-of-time fee and suitable fees for filing of the Appeal Brief are being electronically submitted. The Office is hereby authorized to charge any additional fees required for entry of this paper to Deposit Account 18-1167.

## (I.) REAL PARTY IN INTEREST

The real party in interest is OTV S.A.

## (II.) RELATED APPEALS AND INTERFERENCES

To Applicant's knowledge, there are no related appeals and interferences.

## (III.) STATUS OF CLAIMS

Claims 1-24, 45, and 51 have been canceled.

Claims 25-44, 46-50, 52, and 53 remain pending and stand finally rejected. Applicant appeals the final rejection of all pending claims.

## (IV.) STATUS OF AMENDMENTS

All amendments have been entered.

## (V.) SUMMARY OF CLAIMED SUBJECT MATTER

Claim 25 is directed to a fine filtering apparatus **100** for removing particles from water. The device comprises an elongated housing forming a main body **1** and having an impervious wall enclosing an interior cavity that extends through the housing. *See*, spec. p. 5, lines 1-2 and Figs. 1, 2. A plurality of flexible fibers **6** extend within the cavity for contacting flowing water and removing fine particles from the water without separating a permeate from the water. *See*, spec. p. 5, lines 3-4 and Fig. 2. The housing includes a pair of opposed end portions wherein disposed adjacent a first end portion is a water inlet **2** for receiving a stream of water, the inlet including an annular

water guide jacket **7** extending around the first end portion of the housing and being in fluid communication with the cavity for distributing the water within the cavity. *See*, spec. p. 5, lines 5-6 and Fig. 2. A header jacket **16** is disposed extending around a second end portion of the housing. *See*, spec. p. 5, lines 17-18 and Fig. 2. The header jacket **16** includes a clarified water outlet **3** for discharging clarified water from the cavity. *See*, spec. 9, lines 16-19 and Fig. 2. The header jacket **16** also includes a waste outlet **5** for discharging concentrated waste from the cavity. *See*, spec. p. 8, lines 2-4 and Fig. 2. Further, the device includes an air inlet **4** for directing air into the cavity such that the air may contact the fibers **6** and clean some of the fine particles from the fibers **6**. *See*, spec. p. 9, lines 7-10 and Fig. 2.

**FIG. 1**

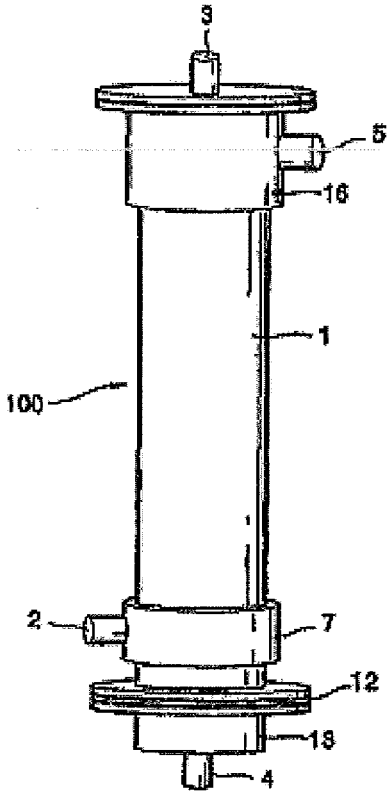
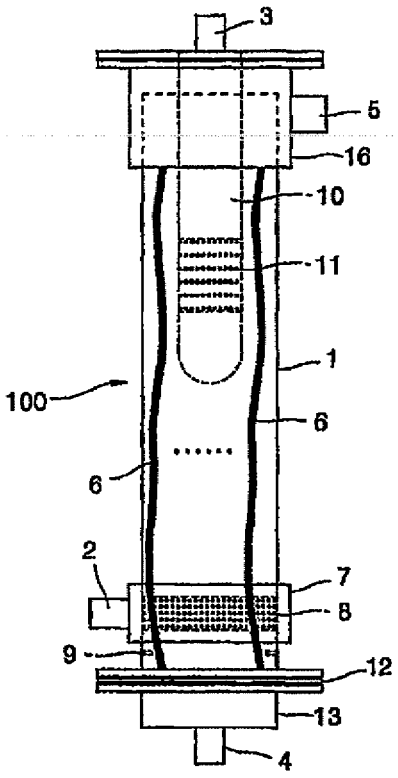
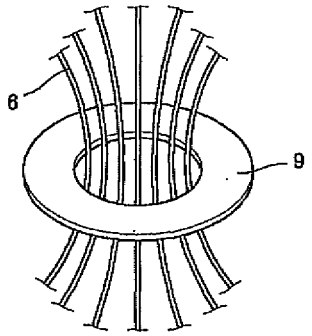



**FIG. 2**



A density control plate **9** having an annular shape is disposed within the housing below the water guide jacket **7** for increasing a density of the fibers **6** below the water guide jacket **7** and for generally inhibiting the water from flowing downwardly in a direction toward the air inlet **4**. *See*, spec. p. 8, lines 10-11, p. 5, lines 9-12, and Figs. 2 and 10.

**FIG. 10**




In one mode of operation, the water is directed through the cavity and some of the fine particles are removed from the water producing the clarified water that is discharged from the cavity via the clarified water outlet **3**. *See*, spec. p. 10, lines 1- 15 and Figs. 12. The arrow in Fig. 12 illustrates the flow of the water in this mode of operation. In another mode of operation, both the air and the water are directed through the cavity and some of the fine particles are cleaned from the fibers **6** producing the concentrated waste that is discharged from the cavity through the waste outlet **5**. *See*, spec. p. 10, lines 15- 33 and Figs. 12 and 13. The arrow in Fig. 13 illustrates the flow of the water in this mode of operation.

**FIG. 12**

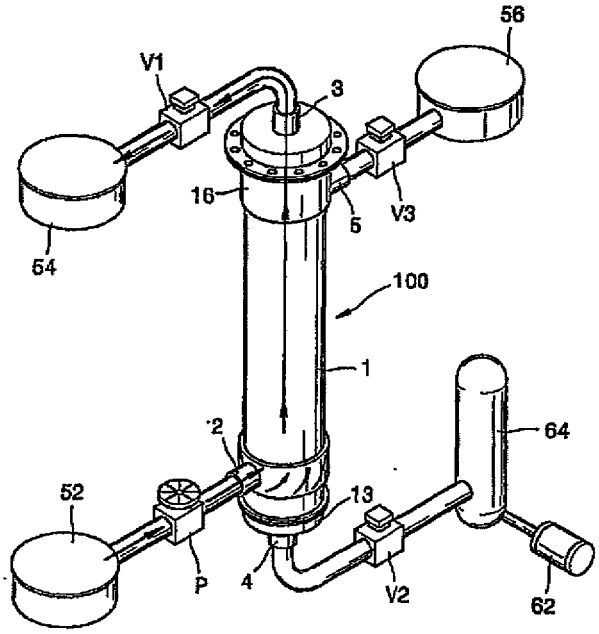
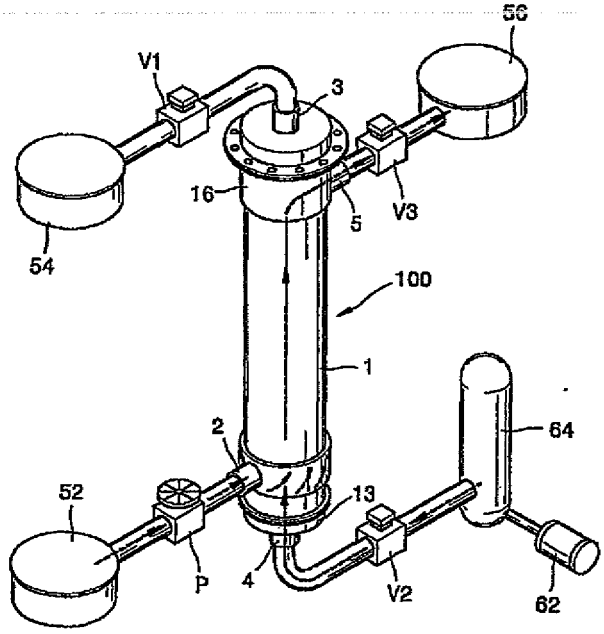
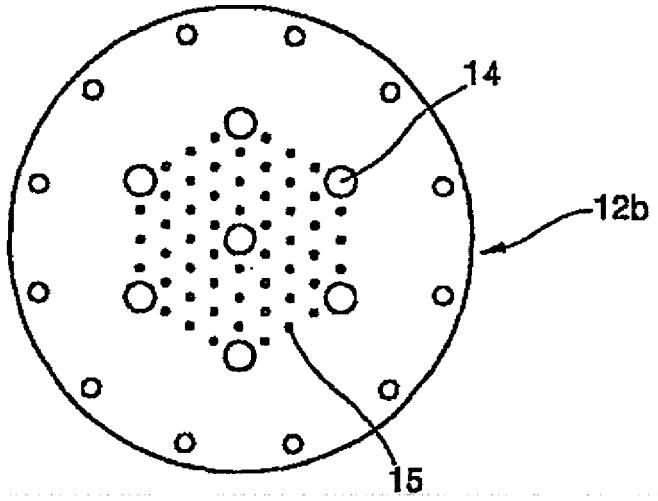

56
V1
3
16
5
V3
54
100
1
2
64
52
13
P
4
V2
62

**FIG. 13**


56
V1
3
16
5
V3
54
100
1
2
64
52
13
P
4
V2
62

Claim 30 depends from claim 29 and requires that the one or more air supply holes **14** form an array of air supply holes **14** disposed in a media fixing plate **12**. *See*, spec. p. 9, lines 5-8 and Figs. 7 and 8. The array of air supply holes **14** are disposed adjacent ends of the fibers **6** that are secured in the plate **12** and which act to disperse the air about the fibers **6**. *See*, spec. p. 9, lines 5-8 and Figs. 2, 7, and 8.

**FIG. 7**




Claim 32 depends from claim 25 and includes a porous chamber **10** in fluid communication with the clarified water outlet **3**. Spec, p. 7 line 31 through p. 8 line 1 and Fig. 2. The chamber **10** is disposed in the second end portion of the housing and projects inwardly among the fibers **6** to receive the clarified water from the cavity. Spec, p. 7 line 31 through p. 8 line 1 and Fig. 2.

Claim 34 is directed toward a fine filtering apparatus **100** for removing fine particles from water directed from a water source. The device comprises an elongated housing forming a main body **1** and having an impervious outer wall comprising a

substantial portion of the main body **1**. *See*, spec. p. 5, lines 1-2 and Figs. 1, 2. An interior cavity extends through the housing and is substantially enclosed within the outer wall. *See*, spec. p. 5, lines 1-5 and Fig. 2. A plurality of flexible fibers **6** extends within the cavity for contacting flowing water and removing fine particles from the water. *See*, spec. p. 5, lines 3-4 and Fig. 2. First and second end portions of the housing are each disposed adjacent opposite first and second ends of the housing. *See*, spec. p. 5, lines 5-6 and Fig. 2. A water inlet **2** is disposed on the first end portion for directing the water into the cavity. *See*, spec. p. 5, lines 5-6 and Fig. 2. The second end portion of the housing includes a clarified water outlet **3** for discharging clarified water from the cavity and a waste outlet **5** for discharging a concentrated waste from the cavity. *See*, spec. 9, lines 16-19 and Fig. 2. An air inlet **4** is disposed adjacent the first end portion for directing air into the cavity for contacting the fibers **6** and for cleaning some of the fine particles from the fibers. *See*, spec. p. 9, lines 7-10 and Fig. 2. Further, the device includes a density control plate **9** for increasing the density of the fibers 6 in an area of the cavity between the water inlet **2** and the air inlet **4**. *See*, spec. p. 8, lines 10-11, p. 5, lines 9-12, and Fig. 2. The increased density of the fibers **6** generally inhibits the water from flowing in a direction from the water inlet **2** towards the air inlet **4**. *See*, spec. p. 8, lines 10-11, p. 5, lines 9-12, and Figs. 2, 9 and 10. The density control plate **9** comprises an annular plate disposed within the housing between the water inlet **2** and the air inlet **4** and has an opening through which the fibers **6** extend. *See*, spec. p. 8, lines 10-11, p. 5, lines 9-12, and Figs. 2, 9 and 10. The annular plate **9** constrains the fibers **6** to the opening thereof, thereby increasing the density of the fibers **6** in the opening of the annular plate **6** and generally inhibiting the flow of water from the water

inlet **2**, through the opening of the annular plate **9**, to the air inlet **4**. *See*, spec. p. 8, lines 10-11, p. 5, lines 9-12, and Figs. 2, 9 and 10. In one mode of operation, the water is directed through the cavity and some of the fine particles are removed from the water, producing the clarified water that is discharged via the clarified water outlet **3**. *See*, spec. p. 10, lines 1- 15 and Figs. 12 and 13. In another mode of operation, both the air and the water are directed through the cavity and some of the fine particles are cleaned from the fibers producing the concentrated waste that is discharged via the waste outlet **5**. *See*, spec. p. 10, lines 15- 33 and Figs. 12 and 13.

Claim 38 depends from claim 34 and requires an array of air supply holes **14** in a media fixing plate **12** disposed within the housing. Spec, p. 8, lines 12-20 and Figs. 6 and 7. The plate **12** has the ends of the fibers **6** secured thereto and the array of openings **14** is disposed adjacent the ends of the fibers **6** for conducting the air into the cavity and dispersing the air about the fibers **6**. Spec, p. 8, lines 12-20 and Figs. 6 and 7.

Claim 40 depends from claim 34 and requires a chamber **10** having an array of openings **11** in an outer wall thereof. Spec, p. 7 line 31 through p. 8 line 1 and Fig. 2. The chamber **10** is in fluid communication with the clarified water outlet **3** and is disposed in the second end portion of the housing and projects inwardly among the fibers **6** for receiving the clarified water. Spec, p. 7 line 31 through p. 8 line 1 and Fig. 2.

Claim 41 is directed to a method of treating water having fine particles therein with a device having a treatment cavity, an air inlet **4** and a water guide jacket **7** comprising a water inlet **2** disposed on one portion of the device, and a clarified water outlet **3** and a concentrated waste outlet **5** disposed on another portion of the device.

*See*, spec. p. 5, lines 5-6, p.9, lines 2-4, p. 9, lines 7-10, 16-19, and Fig. 2. The method includes closing the concentrated waste outlet **5** and opening the clarified water outlet **3**. *See*, spec. p. 9 line 29 through p. 10, line 4, and Fig.12. Further, the method includes directing the water into the water inlet **2** in the water guide jacket **7** and through the treatment cavity. *See*, spec. p. 9 line 29 through p. 10, line 4, and Fig.12. The density of a plurality of flexible fibers **6** extending within the treatment cavity in an area below the water guide jacket **7** is increased using a density control plate **9** to inhibit the water from flowing downwardly in a direction toward the air inlet. *See*, spec. p. 8, lines 10-11, p. 5, lines 9-12, and Fig. 2. As the water is passed through the treatment cavity, water flows adjacent a plurality of flexible fibers **6** extending within the treatment cavity and fine particles from the water are removed without separating a permeate from the water. *See*, spec. p. 10, lines 4-15, and Fig.12. The clarified water is discharged out the clarified water outlet **3**. *See*, spec. p. 9 line 29 through p. 10, line 4, and Fig.12. In addition, the method includes closing the clarified water outlet **3** and opening the concentrated waste outlet **5**. *See*, spec. p. 10 lines 16-20, and Fig.13. Air is injected from an air inlet **4** into the treatment cavity through openings **14** disposed in a media fixing plate **12** to which the fibers **6** are attached and mixed with the water having the fine particles to form an air-water mixture. *See*, spec. p. 9, lines 5-10 and p. 10 lines 21-33, and Figs. 2 and 13. The air-water mixture is passed through the treatment cavity to contact the fibers **6** and dislodge the fine particles captured on the fibers **6**. *See*, spec. p. 10 lines 21-33, and Fig.13. This produces a concentrated waste including the air-water mixture and the dislodged fine particles. *See*, spec. p. 10 lines 21-33, and

Fig.13. The concentrated waste is discharged through the concentrated waste outlet **5**. *See*, spec. p. 10 lines 21-33, and Fig.13.

## (VI.) GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Whether claims 25-33 are obvious under § 103 over PCT Publication No. WO 2002/24306 (Boye) in view of U.S. Patent No. 5,053,130 (Raff) and in further view of Patent No. 4,219,426 (Spekle), and sometimes in further view of U.S. Patent No. 4,793,932 (Ford), or sometimes in further view of U.S. Patent No. 4,617,120 (Barzuza).

Whether claims 34-40 are obvious under § 103 over Boye in view of Raff and sometimes in further view of U.S. Patent No. 6,524,481 (Zha), or sometimes in further view of Speckle and Zha, or sometimes in further view Barzuza.

Whether claims 41-44, 46-50, 52, and 53 are obvious under § 103 over Boye in view of Raff and in further view of U.S. Patent No. 5,607,593 (Cote) and sometimes in further view of Barzuza.

## (VII.) ARGUMENT

### A. Law of Obviousness

In a 35 U.S.C. §103 rejection, the Examiner bears the initial burden to present a *prima facie* case of obviousness. In order to set forth a proper §103 rejection, the Examiner must provide a proposed modification of the primary reference necessary to arrive at the claimed subject matter. Further, to establish a *prima facie* case of obviousness, the "references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would

have found the claimed invention obvious in light of the teachings of the references." MPEP §706.02(j).

The determination of obviousness should include an analysis of the pertinent facts for the case and an explanation as to why the invention is obvious. Accordingly, the Examiner must articulate the facts for the specific case, and provide an *explicit* explanation of the reasoning to support a conclusion that the invention is obvious. *See KSR v. Teleflex*, 550 U.S. 398, 418 (2007). "[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *Id.* (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006). Additionally, any proposed modification of a primary reference cannot render the prior art unsatisfactory for its intended purpose or change the principle operation of the reference. *See*, MPEP §2145. Thus, "it is improper to combine references where the references teach away from their combination." *In re Grasselli*, 713 F.2d 731, 743, 218 USPQ 769, 779 (Fed. Cir.1983). The Federal Circuit has held that a reference teaches away from a particular teaching if upon reading the reference, one of ordinary skill in the art would be "led a direction divergent from the path that was taken by the applicant." *In re Haruna*, 249 F.3d 1327, 1335 (Fed. Cir. 2001).

**B. Independent Claims 25, 34, and 41 are Not Obvious over the Cited Art**

***1. The Examiner erred in finding that Raff teaches or suggests the claimed density control plate***

Claim 25 requires "a density control plate...disposed within the housing below the water guide jacket for increasing a density of the fibers below the water guide jacket and for generally inhibiting the water from flowing downwardly in a direction toward the air inlet." For reference Figs. 2 and 10 are provided below. The density control plate is indicated by reference numeral 9 and the water guide jacket is indicated by reference numeral 7. As shown therein, the density control plate 9 is disposed in the housing 1 below the water guide jacket 7. The density control plate 9 increases the density of the fibers below the water guide jacket 7 and inhibits the water from flowing downwardly in a direction toward the air inlet 4.

**FIG. 2**

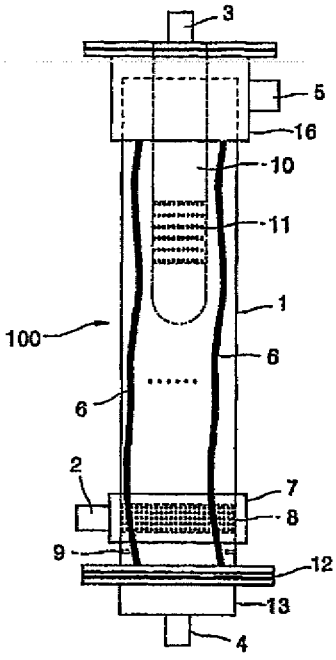
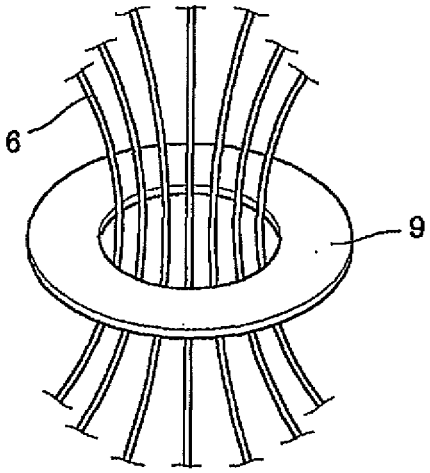
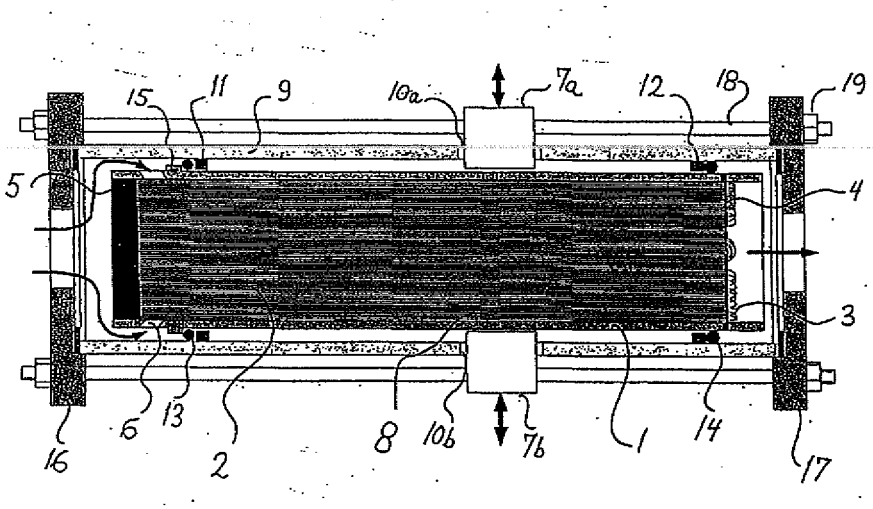



**FIG. 10**



The Examiner acknowledges that the primary reference – Boye – does not disclose a ***density control plate disposed below the water guide jacket***, as claimed. For instance, the Examiner alleges that the areas surrounding Boye's inlets 6 (to the left in Fig. 1 below) is a water guide jacket. Further, the Examiner alleges that Boye describes several density control plates but none of which are disposed below the alleged water guide jacket.[1] For example, Boye's compressing means 7a, 7b shown in Fig. 1 below, which is alleged to be a density control plate, is placed at a position approximately 2/3 of the length of the fibers. Boye, p. 12, lines 14-17. The Examiner finds that when the device is turned on its end, none of the alleged density control plates are disposed "below" the alleged water guide jacket, as required by the claim. Instead, all of the alleged density control plates disposed "above" the alleged water guide jacket.




[1] The Examiner alleges that Boye's compressing means 7a, 7b, inner collars 11, 12, compression means 303, and ring 314 are all "density control plates." However, only compressing means 7a, 7b, and compression means 303 can reasonable be deemed to control the density of fibers. The inner collars 11/12 merely form a stop and keep the o-rings 13/14 in place. *See*, Boye, p. 12, line 34 through p. 13, line 4. Ring 314 merely provides for a turbulent liquid flow during the flushing process. *See*, Boye, p. 18,

Accordingly, the Examiner cites Raff's ring 6b as being a density control plate disposed below a water guide jacket (allegedly expanded portion 7b). Final Action, p. 8. Raff's Figs. 8 and 9 are provided below for reference. Thus, the Examiner concludes that when placed on its end (near reference numeral 12b in Fig. 8), the Raff device has a density control plate disposed below a water guide jacket. However, one of ordinary skill in the art would never interpret Raff's ring 6b to be a density control plate. Nothing in Raff describes that ring 6b controls the density of the fibers or inhibits the water from flowing in a particular direction, as claimed. For instance, ring 6b never engages the fibers or provides any force upon the fibers. Thus, it is impossible for ring 6b to be a density control plate. Instead, Raff's ring 6b provides a reduced attachment between the wall 3b and the housing 2b to prevent cracks in the wall 3b and the housing 2b when the filtration device is cured. Raff, col. 1, lines 43-64. For example, Raff states that:

> "ring member has a coefficient of adhesion in relation to the end wall which is lower than the coefficient of adhesion in relation to the housing. As a result, the structural integrity of the housing and the seal created by the end wall is enhanced and the risk of cracks therein is substantially eliminated."

Raff, col. 2, lines 17-25;

---

lines 4-9. Neither the inner collars 11/12 nor the ring 314 have any affect on the density of the fibers and thus, it is impossible for these elements to be density control plates.

FIG. 8

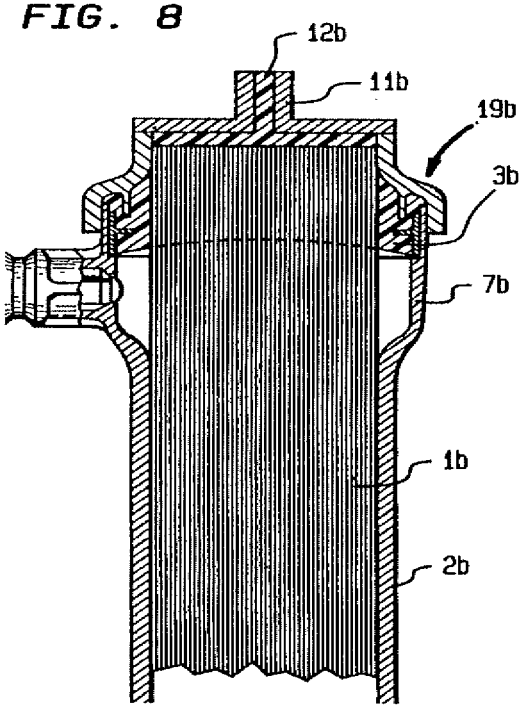
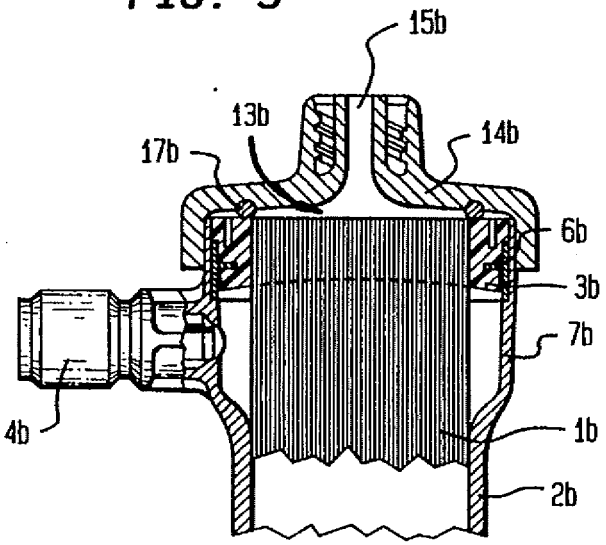



FIG. 9




In order to properly read on the claimed invention, the Examiner must point to a density control plate - not just *any* ring. That is, the Examiner must point to an element that actually affects the density of the fibers in the filtration device. Because the Examiner has failed to show *any element* that could reasonably be deemed a density control plate and which is also disposed below a water guide jacket, the rejection of independent claim 25 fails as a matter of law. For at least this reason, the pending claims are not rendered obvious over the cited art.

Related limitations are found in independent claims 34 and 41. Claim 34 requires "a density control plate for increasing the density of the fibers in an area of the cavity between the water inlet and the air inlet and wherein the increased density of the fibers generally inhibits the water from flowing in a direction from the water inlet towards the air inlet." Likewise, claim 41 requires "increasing the density of a plurality of flexible

fibers extending within the treatment cavity in an area below the water guide jacket using a density control plate to inhibit the water from flowing downwardly in a direction toward the air inlet." For reasons substantially similar to those above, claims 34 and 41 are not obvious over the cited art.

### 2. *The Examiner's motivation to modify Boye fails to support a* prima facie *case of obviousness*

The Examiner's motivation to modify the Boye device in view of the teachings Raff fails to set forth a *prima facie* case of obviousness. The Examiner sates that it would be obvious to include Raff's ring 6 into the Boye device because such "modification [will] enhance the structural integrity of the fiber's seal and substantially eliminate the risk of cracks." Final Action, p. 9. However, merely placing a ring, such as Raff's ring 6b, at a position below Boye's alleged water guide jacket will not necessarily enhance structural integrity or eliminate cracks, as suggested by the Examiner. Raff teaches that in order to enhance structural integrity and eliminate cracks, the ring must be placed between the end walls 3 and the housing 2, 7. Raff, col. 1, lines 55-62 and Figs. 8 and 9 (shown above). Thus, in order to enhance structural integrity or eliminate cracks in Boye, the ring must be placed between an end wall and the housing that have a tendency to crack during curing. The ring cannot merely be placed anywhere below the alleged water guide jacket. Although the Examiner alleges that Boye's housing is shown by reference numeral 1, the Examiner never identifies any structure in Boye to be an end wall similar to that described in Raff. Final Action, p. 3. Further, Boye does not include a separate end wall from housing 1. Thus, it would be impossible to place a ring between an end wall and the housing 1 in Boye. Therefore, one of ordinary skill in

the art would not combine the teachings of Boye and Raff for the reasons set forth by the Examiner.

Further, even if a ring, such as Raff's ring 6b could be placed between an end wall and the housing 1 in Boye, nothing in Boye describes that the putative end wall and housing have a tendency to crack during curing or even that the putative end wall and the housing 1 are cured together. The ring 6b is only beneficial to prevent cracks in the end wall and housing during a curing process – and only if the end wall and housing are made of such a material that is prone to cracking during a curing process. Raff, col. 1, lines 43-64. Accordingly, the rejection of all pending claims fails as a matter of law.

***3. Boye teaches against placing a density control plate "below" the alleged water guide jacket***

As described above, claim 25 requires that the density control plate be disposed "below the water guide jacket." However, one of ordinary skill in the art would not place a density control plate "below" – or to the left – of Boye's alleged water guide jacket (area surrounding inlets 6) because Boye expressly teaches against compressing the fibers in this area. For instance, Boye states that "[i]n order to obtain sufficient space for the deposited particles and in order to avoid early clogging of the filtering device, the jaws 7a/b, and thereby the location of the compressing 8 is preferably arranged so that about 2/3 of the length of the fibre housing is on the inlet side of the jaws 7a/b..." Boye, p. 12, lines 14-17. Thus, Boye teaches that placing a density control plate below the alleged water guide jacket (to the left of inlets 6 in Boye Fig. 1), would cause early clogging of the filtering device. For this additional reason, the rejection fails as a matter of law.

***4. Even if Boye were modified to include the claimed density control plate disposed below the alleged water guide jacket, the suggested modification would not result in the claimed invention***

Claim 25 require that the "density control plate...increase[e] a density of the fibers below the water guide jacket and...inhibit[] the water from flowing downwardly in a direction toward the air inlet." However, if a ring, such as Raff's ring 6b were placed below the alleged water guide jacket in Boye, such modification of Boye would not result in a density control plate that inhibits the water from flowing in a direction toward the air inlet, as required by the claim. For example, if Raff's ring 6b was placed "below" the alleged water guide jacket (area surrounding inlets 6), then the ring 6b must be placed to the area left of inlets 6. However, placing the alleged density control plate in this location would not inhibit the water from flowing in a direction toward the air inlet (to the right in Fig. 1), as required by the claim. Instead, the water entering the fibers would completely bypass the alleged density control plate and enter the fibers through inlets 6. For example, the arrows in Boye's Fig. 1 show the path of the water flow into the fibers. The alleged density control plate would have no effect on the flow of the water. The only way for a density control plate to affect the flow of water in Boye is to place a density control plate "above" - or to the right - of the alleged water guide jacket (area surrounding inlets 6). For this additional reason the obviousness rejection of claim 25 fails as a matter of law.

Similarly, claim 34 requires "a density control plate for increasing the density of the fibers in an area of the cavity between the water inlet and the air inlet and wherein the increased density of the fibers generally inhibits the water from flowing in a direction

from the water inlet towards the air inlet" and claim 41 requires "increasing the density of a plurality of flexible fibers extending within in the treatment cavity in an area below the water guide jacket using a density control plate to inhibit the water from flowing downwardly in a direction toward the air inlet." For reasons substantially similar to those above, claims 34, 41, and the respective dependent claims are not obvious over the cited art.

***5. The Examiner erred in finding that the combination of references teaches or suggests the claimed header jacket***

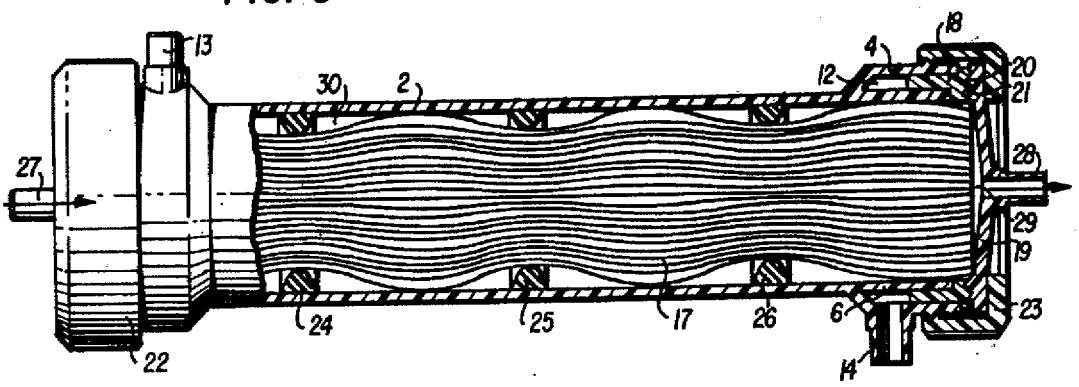
In addition, claim 25 requires a "header jacket including a clarified water outlet...[and] including a waste outlet." In addition, the claim requires that the "header jacket extend[] around a second end portion of the housing." The Examiner states that the header guide jacket is shown by an "arrow exiting the device" in Boye's Fig. 1. Final Action, p. 4. However, the "structure shown at arrow exiting the filter device" in Boye's Fig. 1 does not contain a waste outlet and a separate clarified water outlet, as required by the claim. Instead, the outlet (shown by the arrow exiting the device in Boye's Fig. 1) is used as both the clarified water outlet and the waste outlet. It functions as a clarified water outlet during the filtering mode and as a waste outlet during the cleaning mode. Thus, the outlet pointed to by the Examiner cannot be the claimed header jacket which requires separate waste and clarified water outlets. As shown in Boye's Fig. 2, separate clarified water and waste outlets are disposed downstream from the filtering device. However, these outlets do not form a header jacket that "extend[s] around a second end portion of the housing," as required by the claim.

Moreover, the Examiner notes that "[h]eader jackets are known in the art" and cites Raff as describing the claimed header jacket. Final Action, p. 6. The Examiner states that it would have been obvious "to have substituted the Boye header jacket for that disclosed in Raff...since it was known in the art to provide a clarified water outlet and a waste outlet in a filtering apparatus." Final Action, p. 7. However, merely stating that each claim limitation is allegedly found in several different prior art references does not support a *prima facie* of obviousness. MPEP §2143.01 states that "[t]he mere fact that references can be combined or modified does not render the resultant combination obvious..." Instead, the Examiner must set forth some articulated reasoning with a rational underpinning explaining why one of ordinary skill in the art would substitute the alleged header jacket in Boye for the alleged header jacket in Raff.

One of ordinary skill in the art would not modify Boye, as suggested by the Examiner because Boye already has a clarified water outlet and a waste outlet. For example, on page 4 of the Action, the Examiner identifies Boye's clarified water outlet as the "structure shown in Fig. 2, before valve 65...leading to filtered fluid container 70." Likewise, the Examiner identifies Boye's waste outlet as the "structure shown in Fig. 2, before valve 62...leading to deposit container 60." Final Action, p. 4. Since Boye allegedly already contains these claim limitations, one of ordinary skill in the art would have no need to substitute Raff's header jacket into Boye's filtration device. Further, the Examiner has not provided any other reason to modify the Boye device. Accordingly, the §103 rejection fails as a matter of law. Thus, claim 25 and its dependent claims define patentable subject matter over the cited art.

Further, the Examiner alleges that Spekle discloses "a header jacket....extending around a second end portion of the housing." Final Action p. 9. In particular, the Examiner alleges that Spekle's collar 23 and ring 4 form a header jacket and the tubular member 2 forms the housing. Final Action, p. 9. Spekle's Fig. 3 is provided below for reference. The Examiner suggests it would have been obvious to have modified the Boye device in view of the teachings of Spekle.

FIG. 3




However, even if the alleged header jacket in Spekle, collar 23, were included in the Boye device, the modified device does not result in the claimed invention. For example, the alleged header jacket in Spekle – collar 23 – does not include both a clarified water outlet and a waste outlet, as required by the claim. The device in Spekle is a dialysis filter for filtering blood. Spekle describes that the alleged header jacket – collar 23 - only contains one outlet – outlet 28 – which delivers purified blood back into a patient. Thus, outlet 28 can reasonably be deemed analogous to the claimed clarified water outlet. The conduit 14, disposed adjacent to the alleged header jacket, is not contained within the header jacket, and thus, cannot be deemed to form a part of the alleged header jacket, as required by the claim. Instead, conduit 14 is disposed on the

expanded portion 4 of the housing 2. Further, even if the conduit 14 was disposed on the alleged header jacket, conduit 14 is not a waste outlet, as required by the claim. Instead, conduit 14 is an inlet for dialysis liquid. For example, Spekle states:

> "...the dialysis liquid flows in through the conduit 14, then it will first fill the annular chamber 12....The dialysis liquid nowt flows past the fibers in a direction opposite to that of the blood [which flows from left to right in the figure above]....During its passage...the dialysis liquid extracts from the blood waste products...[t]he dialysis liquid finally leaves the artificial kidney through the connection 13."

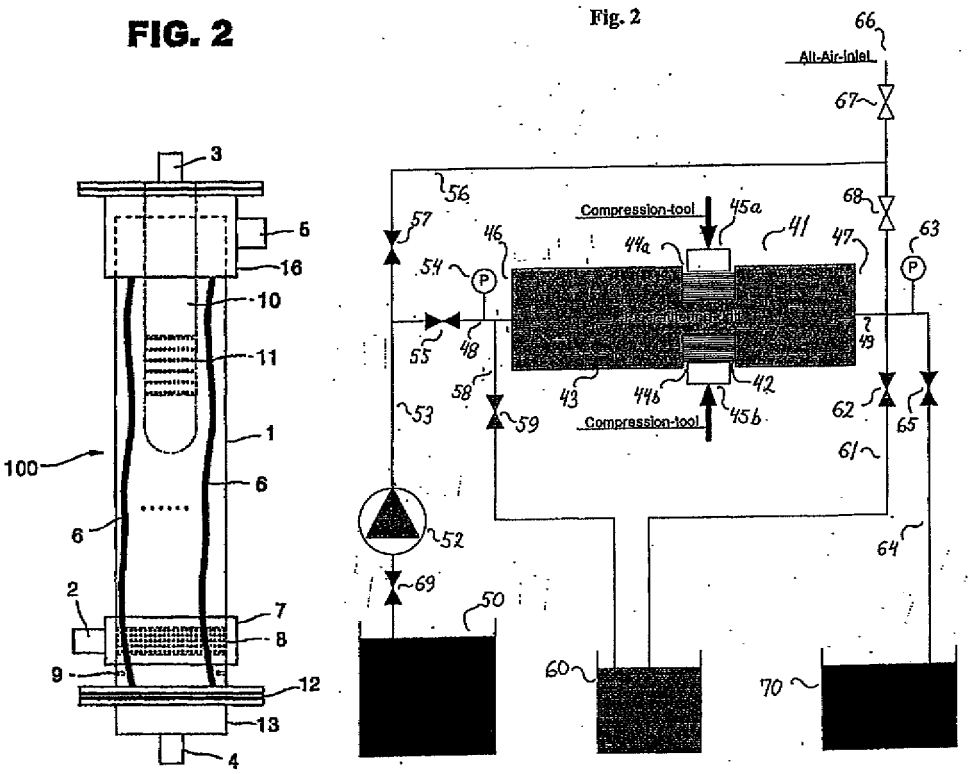
Spekle, col. 5, lines 52-68.

Thus, the waste outlet is conduit 13 – which is disposed on the opposite end of the device from outlet 28 for the purified blood. Conduit 13 does not meet the limitations required of the claimed waste outlet because it does not form part of the header jacket and because it is not disposed on the same end of the device as the clarified water outlet. For this additional reason, claim 25 and its dependent claims are not rendered obvious over the cited art.

### C. The Examiner Erred in Finding that the Cited References Teach or Suggest the Claimed Water Inlet and the Air Inlet in Claim 34

Claim 34 requires "first and second end portions of the housing each disposed adjacent opposite first and second ends of the housing," "a water inlet disposed on the first end portion" and "an air inlet disposed adjacent the first end portion." Thus, the claim requires that the water inlet and the air inlet be disposed on the same end of the housing and adjacent to each other. For example, is this shown in Applicant's Fig. 2 (on the left below), where the air inlet is shown by reference numeral 4 and the water inlet is shown by reference numeral 2.

**FIG. 2**




The Examiner alleges that the claimed water inlet and claimed air inlet are pipe 48 and inlet 66 respectively, as shown Boye's Fig. 2 (shown on the right above). Final Action, p. 3 and p. 10. Further, the Examiner alleges that the claimed "first end portion" is the water inlet end of the device. Final Action, p. 6. However, as shown in Boye's Fig. 2 below, the alleged air inlet is not disposed adjacent to the water inlet end. Instead, the water inlet and the air inlet are disposed on opposite ends of the device. Further, nothing in the cited art has been shown to cure this defect. Accordingly, claim 34 and its dependent claims are not obvious over the cited art.

### D. Claims 30 and 38 are not Obvious over the Cited Art

Claim 30 requires that "one or more air supply holes form an array of air supply holes disposed in a media fixing plate." Claim 38 requires "an array of air supply holes

in a media fixing plate." The Examiner acknowledges that none of the references - Boye, Raff, or Spekle – describe the claimed air supply holes. Final Action, p. 21. Instead, the Examiner cites Zha for this teaching. Further, the Examiner states that it would have been obvious to modify the device in Boye to include air supply holes in a media fixing plate to provide "an apparatus for cleaning a membrane module where liquid and gas bubbles entrained therein move past the surfaces of the membranes to dislodge fouling therefrom." Final Action, p. 22. However, this motivation to modify Boye fails to set forth a *prima facie* case of obviousness.

One of ordinary skill in the art would not modify Boye to include Zha's air supply holes in the media fixing plate because Boye already describes several ways to dislodge fouling materials from the membranes. For example, Boye's air inlet 66 injects liquid or gas into the system to flush the deposit materials from the fibers within the housing. Boye, p. 15, lines 11-23. In a completely different embodiment shown in Boye's Figs. 3 and 4, materials in the membranes are dislodged by flowing "fluid forwards through the fibres while at the same time decompressing the fibres...." Boye, p. 20, lines 11-19. The liquid containing the deposit materials is directed to a deposit container. Boye, p. 20, lines 11-19. Thus, Boye describes several ways to dislodge materials from the fibers. Accordingly, one of ordinary skill in the art would have no reason to look outside of Boye to other references – such as Zha – for teachings on how to dislodge materials from the fibers. Since Boye already contains a way to clean the membranes, one of ordinary skill in the art would have no need to modify the Boye device. For this additional reason, claims 30, 38, and 41 define patentable subject matter over the cited art.

**E. Claims 32 and 40 are not Obvious over the Cited Art**

Claim 32 requires "a porous chamber in fluid communication with the clarified water outlet, the chamber disposed in the second end portion of the housing and projecting in among the fibers to receive the clarified water from the cavity." In addition, claim 40 requires "a chamber having an array of opening in an outer wall thereof, the chamber in fluid communication with the clarified water outlet, and the chamber disposed in the second end portion of the housing and projecting in among the fibers for receiving the clarified water." The Examiner acknowledges that none of references – Boye, Raff, or Spekle – describe the above limitations. Thus, the Examiner cites Barzuza as describing the above limitations and suggests that it would be obvious to modify the Boye device to include the claimed chamber to "provide a fluid filtering device that is self-cleaning by a flushing process and is both reliable and inexpensive." Final Action, p. 22. However, this motivation to modify Boye fails to set forth a *prima facie* case of obviousness.

One of ordinary skill in the art would not modify Boye to include Barzuza's chamber to "provide a fluid filtering device that is self-cleaning by a flushing process" because Boye already describes a fluid filtering device that is self-cleaning by a flushing process. As described above, Boye describes several flushing processes. In one embodiment, Boye's air inlet 66 injects liquid or gas into the system to flush the deposit materials from the fibers within the housing. Boye, p. 15, lines 11-23. In a completely different embodiment shown in Boye's Figs. 3 and 4, materials in the membranes are dislodged by flowing "fluid forwards through the fibres while at the same time decompressing the fibres...." Boye, p. 20, lines 11-19. The liquid containing the deposit

materials is directed to a deposit container. Boye, p. 20, lines 11-19. Thus, Boye describes several ways "self-clean by a flushing process." Accordingly, one of ordinary skill in the art would have no reason to look outside of Boye to other references – such as Barzuza – for teachings on how to self clean by a flushing process. Since Boye already contains several flushing processes, one of ordinary skill in the art would have no need to modify the Boye device. For this additional reason, claim 32 and 40 define patentable subject matter over the cited art.

## CONCLUSION

In view of the above, Examiner has failed to present a legally sufficient *prima facie* case of obviousness under §103. Accordingly, Applicant requests the Board to overturn all claim rejections and hold that all currently pending claims define patentable subject matter over the cited art.

Respectfully submitted,
COATS & BENNETT, P.L.L.C.

Dated:September 28, 2010

Kathleen A. Cavanagh
Registration No.: 59,911
Telephone: (919) 854-1844
Facsimile: (919) 854-2084

## (VIII.) CLAIMS APPENDIX

25. A fine filtering apparatus for removing fine particles from water, the device comprising:

a. an elongated housing forming a main body and having an impervious wall enclosing an interior cavity that extends through the housing;

b. a plurality of flexible fibers extending within the cavity for contacting flowing water and removing fine particles from the water without separating a permeate from the water;

c. the housing including a pair of opposed end portions wherein disposed adjacent a first end portion is a water inlet for receiving a stream of water, the inlet including an annular water guide jacket extending around the first end portion of the housing and being in fluid communication with the cavity for distributing the water within the cavity;

d. a header jacket disposed extending around a second end portion of the housing;

e. the header jacket including a clarified water outlet for discharging a clarified water from the cavity;

f. the header jacket also including a waste outlet for discharging a concentrated waste from the cavity;

g. an air inlet for directing air into the cavity such that the air may contact the fibers and clean some of the fine particles from the fibers;

h. a density control plate having an annular shape and disposed within the housing below the water guide jacket for increasing a density of the fibers below the water

guide jacket and for generally inhibiting the water from flowing downwardly in a direction toward the air inlet;

i. in one mode of operation of the fine filtering apparatus, the water is directed through the cavity and some of the fine particles are removed from the water producing the clarified water that is discharged from the cavity via the clarified water outlet; and

j. in another mode of operation of the fine filtering apparatus, both the air and the water are directed through the cavity and some of the fine particles are cleaned from the fibers producing the concentrated waste that is discharged from the cavity through the waste outlet.

26. The fine filtering apparatus of claim 25 wherein first ends of the fibers are secured to a media fixing plate disposed near a first end of the housing and wherein second ends of the fibers are disposed near a second end of the housing, the second ends of the fibers being unattached and free to move about in the cavity as water passes through the cavity; and wherein the fibers are non-tubular and non-membranous.

27. The fine filtering apparatus of claim 25 wherein one or more of the fibers is formed from a material selected from a group including polyamide, polyester, and polypropylene.

28. The fine filtering apparatus of claim 26 wherein the density control plate increases the density of fibers in an area of the cavity between the water guide jacket and the media fixing plate and wherein the increased density of the fibers generally inhibits the water from flowing in a direction from the water guide jacket towards the media fixing plate, the density control plate comprising an annular shaped plate is disposed within the housing between the media fixing plate and the annular water guide jacket and having an opening through which the fibers extend, wherein the annular plate constrains the fibers to the opening thereof, thereby increasing the density of the fibers in the opening of the annular plate and generally inhibiting the water from flowing from the water guide jacket to the media fixing plate.

29. The fine filtering apparatus of claim 25 including one or more air supply holes disposed in a member within the housing for conducting air into the cavity and dispersing air within the cavity and about the fibers.

30. The fine filtering apparatus of claim 29 wherein the one or more air supply holes form an array of air supply holes disposed in a media fixing plate, the array of air supply holes being disposed adjacent ends of the fibers that are secured in the plate and which act to disperse the air about the fibers.

31. The fine filtering apparatus of claim 25 wherein an array of openings is disposed in a circumferential band around the outer wall of the housing, the array of openings in the outer wall being aligned with the annular water guide jacket to conduct the water into the cavity and to distribute the water within the cavity.

32. The fine filtering apparatus of claim 25 including a porous chamber in fluid communication with the clarified water outlet, the chamber disposed in the second end portion of the housing and projecting in among the fibers to receive the clarified water from the cavity.

33. The fine filtering apparatus of claim 32 wherein a volume of the porous chamber is about 10% to about 50% of a volume of the cavity.

34. A fine filtering apparatus for removing fine particles from water directed from a water source, the device comprising:

a. an elongated housing forming a main body and having an impervious outer wall comprising a substantial portion of the main body;
b. an interior cavity extending through the housing and being substantially enclosed within the outer wall;
c. a plurality of flexible fibers extending within the cavity for contacting flowing water and removing fine particles from the water;
d. first and second end portions of the housing each disposed adjacent opposite first and second ends of the housing;
e. a water inlet disposed on the first end portion for directing the water into the cavity;
f. the second end portion of the housing, including a clarified water outlet for discharging clarified water from the cavity and a waste outlet for discharging a concentrated waste from the cavity;

g. an air inlet disposed adjacent the first end portion for directing air into the cavity for contacting the fibers and for cleaning some of the fine particles from the fibers;

h. a density control plate for increasing the density of the fibers in an area of the cavity between the water inlet and the air inlet and wherein the increased density of the fibers generally inhibits the water from flowing in a direction from the water inlet towards the air inlet, the density control plate comprising an annular plate disposed within the housing between the water inlet and the air inlet and having an opening through which the fibers extend, wherein the annular plate constrains the fibers to the opening thereof, thereby increasing the density of the fibers in the opening of the annular plate and generally inhibiting the flow of water from the water inlet, through the opening of the annular plate, to the air inlet;

i. in one mode of operation of the fine filtering apparatus, the water is directed through the cavity and some of the fine particles are removed from the water, producing the clarified water that is discharged via the clarified water outlet; and

j. in another mode of operation of the fine filtering apparatus, both the air and the water are directed through the cavity and some of the fine particles are cleaned from the fibers producing the concentrated waste that is discharged via the waste outlet.

35. The fine filtering apparatus of claim 34 wherein first ends of the fibers are secured to a media fixing plate disposed near the first end of the housing and wherein second ends of the fibers are disposed near the second end of the housing, and are unattached and free to move about; and wherein the fibers are non-tubular and non-membranous.

36. The fine filtering apparatus of claim 34 wherein the density control plate is disposed within the housing between a media fixing plate and the water inlet, the density control plate increasing a density of fibers between the media fixing plate and the water inlet.

37. The fine filtering apparatus of claim 34 including on or more air supply holes in a member disposed within the housing for conducting the air into the cavity and dispersing the air about the fibers.

38. The fine filtering apparatus of claim 34 including an array of air supply holes in a media fixing plate disposed within the housing, the plate having ends of the fibers secured thereto, the array of openings disposed adjacent the ends of the fibers for conducting the air into the cavity and dispersing the air about the fibers.

39. The fine filtering apparatus of claim 34 wherein an array of openings is disposed in a circumferential band around the outer wall of the housing, the array of openings being aligned with the water inlet which includes an annular water guide jacket to conduct the water into the cavity and to distribute the water within the cavity.

40. The fine filtering apparatus of claim 34 including a chamber having an array of openings in an outer wall thereof, the chamber in fluid communication with the clarified water outlet, and the chamber disposed in the second end portion of the housing and projecting in among the fibers for receiving the clarified water.

41. A method of treating water having fine particles therein with a device having a treatment cavity, an air inlet and a water guide jacket comprising a water inlet disposed

on one portion of the device, and a clarified water outlet and a concentrated waste outlet disposed on another portion of the device, the method including:

a. closing the concentrated waste outlet and opening the clarified water outlet;

b. directing the water into the water inlet in the water guide jacket and through the treatment cavity;

c. increasing the density of a plurality of flexible fibers extending within in the treatment cavity in an area below the water guide jacket using a density control plate to inhibit the water from flowing downwardly in a direction toward the air inlet;

d. as the water is passed through the treatment cavity, flowing the water adjacent the plurality of flexible fibers extending within the treatment cavity and removing fine particles from the water without separating a permeate from the water;

e. discharging the clarified water out the clarified water outlet;

f. closing the clarified water outlet and opening the concentrated waste outlet;

g. injecting air from the air inlet into the treatment cavity through openings disposed in a media fixing plate to which the fibers are attached and mixing the air with the water having the fine particles to form an air-water mixture;

h. passing the air-water mixture through the treatment cavity and contacting the fibers and dislodging the fine particles captured on the fibers, producing a concentrated waste including the air -water mixture and the dislodged fine particles; and

i. discharging the concentrated waste through the concentrated waste outlet.

42. The method of claim 41 wherein respective fibers include opposed ends, and wherein one end of each fiber is fixed while the other end is unattached and free to move about as the water or air-water mixture passes through the treatment cavity; and wherein the fibers are non-tubular and non-membranous.

43. The method of claim 41 wherein increasing the density includes extending the density control plate around a portion of the fibers and generally compressing the fibers in an area of the treatment cavity.

44. The method of claim 41 directing the air into the cavity through one or more air supply holes disposed adjacent the fibers.

46. The method of claim 41 wherein directing the water into the treatment cavity includes directing the water through an array of openings in a circumferential band extending around an outer wall that surrounds the treatment cavity and distributing the water within the cavity.

47. The method of claim 41 including directing the clarified water into a porous chamber in fluid communication with the clarified water outlet, the chamber disposed in the treatment cavity and projecting in among the fibers when the water or air -water mixture is passing through the treatment cavity.

48. The method of claim 41 including generating turbulence in the treatment cavity by contacting the water with the fibers.

49. The method of claim 41 wherein the treatment cavity is formed by an elongated housing and wherein the air inlet and water inlet are disposed adjacent one end portion of the housing and the clarified water outlet and concentrated waste outlet are disposed adjacent an opposite end portion of the housing, and wherein the housing is cylindrical and the fibers extend generally longitudinally through the cavity as the water passes in contact with the fibers.

50. The method of claim 41 wherein the clarified water is discharged out the clarified water outlet while the concentrated waste outlet is closed and wherein the concentrated waste is discharged through the concentrated waste outlet while the clarified water outlet is closed.

52. The method of claim 41 including extending the flexible fibers through a generally central opening formed in an annular plate that is disposed between the water inlet and the air let such that the flexible fibers are constrained by the opening in the annular plate and the density of the flexible fibers in the opening of the annular plate generally inhibits the flow of water from the water inlet to the air inlet.

53. The fine filtering apparatus of claim 35 wherein the flexible fibers remove fine particles from the water without separating a permeate from the water.

## (IX.) EVIDENCE APPENDIX

None.

## (X.) RELATED PROCEEDINGS APPENDIX

None.